AVOIDING THE UNNECESSARY HOSPITAL DAY: UTILIZATION OF CASE MANAGERS AT MONCRIEF army COMMUNITY HOSPITAL, FORT JACKSON, SOUTH CAROLINA

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The purpose of this study was to optimize the use of case managers at Moncrief Army Community Hospital by focusing on those admitting diagnoses that have historically exceeded national length of stay norms for hospitalization. The first step in the study was a retrospective analysis to determine those admission diagnoses that have historically exceeded the expected length of stay by a statistically significant difference. Average lengths of stay (ALOS) for the top 100 DRGs, representing almost 78% (31904 of 40924) of MACH's beddays for FY 1992 were extracted from the Patient Administration Systems and Biostatistics Activity II database and compared with the Intensity of Service, Severity of Illness, and Discharge Readiness (ISD-A) criteria published by InterQual Corporation. Statistical significance was at the a = 0.05 level. Computations of ALOS for particular admission diagnoses that exceeded ISD-A criteria were calculated into total variance days. A variance day is defined as a day that exceeds InterQual criteria for that diagnosis. The total variance days for that diagnosis is defined as the total number of variance days for one year for that diagnosis.

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Abstract

The purpose of this study was to optimize the use of case managers at Moncrief Army Community Hospital by focusing on those admitting diagnoses that have historically exceeded national length of stay norms for hospitalization.

The first step in the study was a retrospective analysis to determine those admission diagnoses that have historically exceeded the expected length of stay by a statistically significant difference. Average lengths of stay (ALOS) for the top 100 DRGs, representing almost 78% (31904 of 40924) of MACH's beddays for Fiscal Year (FY) 1992 were extracted from the Patient Administration Systems and Biostatistics Activity II database and compared with the Intensity of Service, Severity of Illness, and Discharge Readiness (ISD-A) criteria published by InterQual Corporation. Statistical significance was at the $\alpha = 0.05$ level.

Computations of ALOS for particular admission diagnoses that exceeded ISD-A criteria were calculated into total variance days. A variance day is defined as a day that exceeds InterQual criteria for that diagnosis. The total variance days for that diagnosis

is defined as the total number of variance days for one year for that diagnosis. The findings of this study were that, of the top 100 DRGs, 51 exceeded length of stay norms. Of those 51 DRGs, 25 were found to be statistically significant and will lend themselves to individual case management.

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Introduction

Conditions Which Prompted the Study

The percentage of the nation's Gross Domestic Product spent on medical care continues to grow from about two percent in 1950 to an expected thirteen percent in 1992 (Consumers Union, 1992). In an attempt to contain costs, increase access and maintain quality, the emerging model in the health care industry is managed care. This model has grown out of a concern that costs are out of control (South Carolina Hospital Association, 1991).

The Department of Defense (DOD) intends to implement an alternative medical care delivery system similar in design to the private sector's managed care programs. The United States Army Health Services Command (HSC) has already implemented several managed care projects under Gateway To Care (GTC). The GTC program has three goals: ensure access to medical care for all eligible beneficiaries; maintain the quality of health care from all provider sources that is equal to or greater than that of care provided by military medical treatment facilities (MTF); and contain health care costs (U.S. Army Health Services Command, 1991b). The organizational entity responsible for implementing

GTC is the MTF Commander. The Coordinated Care Division (CCD) has been organized to facilitate this implementation.

In its Organization and Functions Manual, Regulation 10-1 (September, 1991a), HSC identified eighteen tasks for which the CCD would be responsible. One of the major tasks outlined is to develop and maintain a utilization management (UM) system. Within this general guidance, considerable latitude is allowed to the hospital commander to design and implement policies and procedures to carry out this task. No specific guidance is given in reference to case management.

In its present configuration at Moncrief Army Community Hospital (MACH), UM is carried on by several different organizational entities.

Appendix BB of Moncrief Regulation 15-1 (1992) proscribes the UM committee structure:

> [The Utilization Management Committee provides the Medical Department Activity (MEDDAC)] Commander an ongoing road map for the provision of medical services to the patient public. In cooperation with the Program Budget Advisory Committee, which recommends <u>how</u> the MEDDAC invests its resources,

> the Utilization Management Committee recommends what programs and missions the MEDDAC will support. (p. BB-1)

One of the major functions of UM is preadmission review. The function of preadmission review at MACH is carried out by the Patient Administration Division (PAD). The PAD employs a registered nurse (GS-7) to meet the requirements of many third-party payors to obtain authorization prior to nonemergent hospitalization.

The CCD at MACH has a UM section, however, this section is not currently staffed because of a DOD-wide hiring freeze. The CCD also has formed a UM subcommittee to develop the overall utilization management plan. This subcommittee is in the embryonic stage.

Need for the Study

The Department of Nursing (DON) at MACH is undergoing a reorganization pilot study, which has been approved by HSC for a one year trial. This reorganization created a Deputy Commander for Nursing position, and it eliminated the evening and night nursing supervisor positions. The DON has been able to shift its authorizations because of the elimination of

these positions and has implemented three positions for case managers. The role of the case managers is developing; however, the goal is to use critical pathways as an effective tool for quality improvement and UM.

With the implementation of GTC, the MEDDAC Commander is responsible for the expenditure of Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) money. The success of the organization will be determined, to a large extent, by how well we manage our resources. We no longer will seek to increase our workload merely to maintain our staffing levels, nor will we be able to send everyone out to a civilian facility to expend CHAMPUS dollars. Our ability to avoid unnecessary hospitalization has the potential to save large amounts of money. A study conducted by the actuarial firm Milliman & Robertson (Vibbert, 1991) found that over half of all inpatient days are unnecessary. Savings will be realized from reduced staffing, fewer ancillary procedures, and fewer supplies being expended. Kennedy (1992) states that the avoidable hospital day is the most expensive unnecessary item commonly provided by the hospital. Each avoidable hospital day costs between $200 and

$300. These are dollars that will never be recovered, and they add nothing to quality outcomes.

In addition to the potential to save money, unnecessary hospitalization is a quality issue. Every unnecessary hospital day increases the risk of nosocomial infections, medication errors, patient falls, and may result in a decrease in patient satisfaction.

Statement of the Management Problem

What are the admission diagnoses that are most apt to benefit from individual case management?

Working Literature Review

Utilization review (UR) has been required for participation in the Medicare program since 1965 (Fowler, 1989). The UR department's responsibility was to review the appropriateness of admission and continued stay in a hospital. UR was also mandated by external organizations such as the Peer Standards Review Organization, the forerunner of the Peer Review Organization (PRO), as well as the Joint Commission on Accreditation of Healthcare Organizations (JCAHO).

Until recently, little effective emphasis was placed on the UR process (Wilson, 1988). Surveyors generally accepted a UR plan and committee minutes as

evidence the hospital had a UR program. Because hospitals were paid based on charges, they lacked incentives to develop programs that would reduce charges through improved utilization.

The Prospective Payment System placed hospitals at financial risk for care provided to Medicare patients (Krebs & Stone, 1990). Reimbursement was determined in advance based on the patient's diagnosis. PROs actively reviewed and denied admissions they considered to be medically unnecessary or inappropriate. To compensate for this revenue loss, some hospitals shifted costs to other third party payors. These payors, in turn, developed aggressive utilization review programs to control costs. A result of these programs had been an increase in payment denial. Hospitals responded to the denials by strengthening their utilization review departments. The department's primary objective was to ensure compliance with external rules and regulations and to avoid admission denials or quality issues. Utilization of resources and cost of care issues were rarely addressed.

Increasingly, though, hospitals are finding that proactive management of patient care leads to significant cost savings (Baschon, 1992). Many studies

have found that a significant portion of inpatient hospital care is nonacute; that is, it need not be furnished in an acute-care inpatient setting (Livingston et al., 1989). In many of these instances, treatment could have been rendered in less costly subacute settings, such as outpatient clinics or ambulatory surgery centers. Other attempts to avoid unnecessary hospitalization have included increasing cost-sharing arrangements, such as higher patient co-payments and deductibles. However, a study by the RAND Corporation has shown that such arrangements, while reducing inappropriate hospitalizations, may reduce appropriate hospitalizations as well (Payne, 1987).

Livingston et al. (1989) found that efforts to identify nonacute hospital care have usually relied on UM mechanisms such as the Appropriateness Evaluation Protocol, the Standardized Medreview Instrument, or the Intensity, Severity, Discharge-Appropriateness (ISD-A). Trained UM personnel, usually registered nurses, typically apply these criteria to identify inappropriate settings for care during pre-admission review. Physician reviewers then authenticate any findings of inappropriate hospitalization. Regardless

of the organization's approach, be it pre-admission, concurrent review, or case management, most UM programs use similar sets of criteria in their analysis methods.

Paranjpe (1989) found that focused UM strategies are most effective at decreasing unnecessary hospitalization. A focused strategy is one that maximizes the number of nonacute admissions found, while minimizing the number of cases examined. Strategies that focus on just one of the objectives tend to be ineffective.

A utilization management strategy increasingly used by hospitals and health maintenance organizations is case management (Baschon, 1992). Many programs use nurses as case managers, and there are as many models of case management as there are hospitals. Third party payors use case management for catastrophic cases. Outpatient mental health programs also utilize case management. These case management programs have been very successful in reducing length of stay and costs for treating patients. Diagnoses known to be costly and problematic are closely monitored. Baschon reports that some hospitals have reported reducing costs by as much as twenty percent within the first year of implementing case management. In addition, many

patients also report increased satisfaction when case managers are assigned to them. Rather than feeling lost in the hospital bureaucracy, patients have someone they know by name to manage their care.

Del Togno, Harter and Olivas (1989) argue that case management must be a multidisciplinary process which uses a case-type method to achieve reduced unnecessary hospitalization. Their model uses critical pathways to identify and specify critical care events in the hospital episode for certain high-cost medical diagnoses.

Baschon (1992) uses a similar approach. She proposes a model of a hospital-wide case management department. A case manager, usually a registered nurse (although she points out that some hospitals use clinically trained social workers), follows the patient throughout the hospitalization, frequently becoming involved with the patient prior to hospitalization. The case manager's primary responsibility is to ensure the patient receives timely and efficient care.

Baschon's model uses clinical progressions, which she defines as a flowchart that identifies important aspects of patient care for a particular diagnosis. It is generally written in calendar form with patient

milestones and nursing interventions noted on the hospital day they are expected to occur. She points out that clinical progressions offer tremendous opportunities for reducing ALOS. As a progression is developed, each test, procedure, and treatment is evaluated by practitioners that specialize in the type of care described on the progression. The ensuing discussion leads to consensus on appropriate practice. When published and monitored daily, complications can be identified early and action taken to resolve the problems. The end result is a patient with a less costly stay and a better outcome.

Baschon states that many physicians are resistant to clinical progressions. They perceive them as cookbook medicine. However, she contends that clinical progressions offer more positive than negative aspects. The physician, who often has a heavy patient load, no longer is expected to remember everything. The format allows nurses to follow-up on necessary tests and procedures or obtain reports without bothering the physician. In the end, a great deal of time is saved for both the physician and the patient.

Pierog (1991) proposes a product-line case management model. Hospitals provide intermediate

products for which they expend resources, such as laboratory, radiology, surgery, and dietary services. The real products, however, should be the outcome of the admitting diagnosis and the care associated with the discharge diagnosis. Thus, the development of hospital product lines should actually be related to the admitting and discharge diagnosis. The areas coordinating the intermediate products in practice become strategic business units with decentralized decision making and direct financial benefit to the hospital. The ultimate result of the clinical care production process is a true product-line momentum. Her definition of case management is "managing the case as it travels between product-line areas both in and then out of the acute care hospital into outpatient or home health environments, with resultant continuity between health care providers" (p. 17). The products of case management are an integration of services in an efficient and effective manner, increasing the profitability of other reimbursable products in the hospital.

Kennedy (1992) likens avoidable hospital days to $100 bills that are lost forever. He argues that hospitals should hold physicians, hospital personnel

and hospital departments accountable for unnecessary hospital days. His model calls for case managers to track Possibly Avoidable Days, a listing of which is then sent to every individual or group responsible for the lost day.

Purpose of the Study

The purpose of this study is to optimize the use of case managers by focusing on those admitting diagnoses that have historically exceeded national length of stay norms for hospitalization.

Method and Procedures

Data

ALOS for the top 100 DRGs, representing almost 78% (31904 of 40924) of MACH's beddays, were extracted from the Patient Administration Systems and Biostatistics Activity II (PASBA2) database and are listed as Table 1 on pages 13 and 14. ALOS norms for these same DRGs were obtained by the Intensity of Service, Severity of Illness, and Discharge Readiness (ISD-A) standards published by InterQual Corporation. ALOS for those DRGs that exceed ISD-A standards are listed as Table 2 on page 15.

Table 1

Top 100 DRGs

	DRG CODE	DRG TITLE	NUM DISPO1	BEDDAYS2	MACH ALOS3	ISD-A STANDARD4	PERCENT OF ISD-A5	# DAYS DIFFERENCE6
1	069	OTITIS MEDIA & URI > 17 W/O CC	856	2493	2.91	2.97	98.06%	-49.32
2	421	VIRAL ILLNESS AGE > 17	823	2399	2.91	4.14	70.41%	-1008.22
3	183	ESOPHAGITIS, GASTROENT, & MISC DIGESTIVE DISO	456	987	2.16	3.03	71.43%	-394.68
4	187	DENTAL EXTRACTIONS & RESTORATIONS	311	577	1.86	1.50	123.69%	110.5
5	090	SIMPLE PNEUMONIA & PLEURISY > 17 W/O CC	219	1090	4.98	6.40	77.77%	-311.6
6	097	BRONCHITIS & ASTHMA > 17 W/O CC	178	649	3.65	4.98	73.21%	-237.44
7	231	LOCAL EXCISION & REMOVAL OF INT FIX DEVICES E	162	1108	6.84	3.65	187.38%	516.7
8	428	DISORDERS OF PERSONALITY & IMPULSE CONTROL	156	1361	8.72	11.74	74.31%	-470.44
9	189	OTHER DIGESTIVE SYSTEM DIAGNOSES > 17 W/O CC	156	224	1.44	2.91	49.34%	-229.96
10	222	KNEE PROCEDURES W/O CC	152	995	6.55	3.55	184.40%	455.4
11	062	MYRINGOTOMY WITH TUBE INSERTION 0-17	136	154	1.13	1.78	63.62%	-88.08
12	278	CELLULITIS > 17 W/O CC	134	594	4.43	5.07	87.43%	-85.38
13	427	NEUROSES EXCEPT DEPRESSIVE	130	1005	7.73	7.38	104.75%	45.6
14	182	ESOPHAGITIS, GASTROENT, & MISC DIGEST DISORDE	126	555	4.40	3.37	130.71%	130.38
15	039	LENS PROCEDURES W OR W/O VITRECTOMY	107	213	1.99	1.01	197.09%	104.93
16	225	FOOT PROCEDURES	102	313	3.07	3.48	88.18%	-41.96
17	284	MINOR SKIN DISORDERS W/O CC	100	387	3.87	4.50	86.00%	-63
18	162	INGUINAL & FEMORAL HERNIA PROCEDURES AGE >17	88	563	6.40	2.51	254.89%	342.12
19	359	UTERUS & ADENEXA PROC FOR NON-MALIGNANCY W/O	86	430	5.00	3.89	128.53%	95.46
20	070	OTITIS MEDIA & URI 0-17	84	226	2.69	2.79	96.43%	-8.36
21	068	OTITIS MEDIA & URI > 17 W CC	83	313	3.77	4.15	90.87%	-31.45
22	229	HAND OR WRIST PROC, EXCEPT MAJOR JOINT PROC,	76	205	2.70	1.94	139.04%	57.56
23	410	CHEMOTHERAPY	75	288	3.84	3.26	117.79%	43.5
24	143	CHEST PAIN	70	138	1.97	5.98	32.97%	-280.6
25	243	MEDICAL BACK PROBLEMS	69	600	8.70	4.45	195.41%	292.95
26	239	PATH FRACTURES & MUSCULOSKELETAL & CONN TISS	66	1231	18.65	9.02	206.78%	635.68
27	422	VIRAL ILLNESS & FEVER OF UNKNOWN ORIGIN 0-17	66	173	2.62	3.14	83.48%	-34.24
28	256	OTHER MUSCULOSKELETAL SYSTEM & CONN TISSUE DI	64	618	9.66	5.27	183.23%	280.72
29	262	BREAST BIOPSY & LOCAL EXCISION FOR NON-MALIGN	64	115	1.80	1.74	103.27%	3.64
30	277	CELLULITIS > 17 W CC	63	306	4.86	7.67	63.33%	-177.21
31	270	OTHER SKIN, SUBCUT TISS & BREAST OR PROC W/O	62	212	3.42	3.09	110.66%	20.42
32	227	SOFT TISSUE PROCEDURES W/O CC	58	213	3.67	4.15	88.49%	-27.7
33	184	ESOPHAGITIS, GASTROENT & MISC DIG DISORDERS 0	55	128	2.33	2.43	95.77%	-5.65
34	369	MENSTRUAL & OTHER FEMALE REPRO SYSTEM DISORDE	53	233	4.40	2.66	165.27%	92.02
35	175	G.I. HEMORRHAGE W/O CC	52	100	1.92	5.21	36.91%	-170.92
36	426	DEPRESSIVE NEUROSES	51	427	8.37	7.80	107.34%	29.2
37	060	TONSILLECTOMY &/OR ADENOIDECTOMY ONLY, AGE 0-	50	82	1.64	1.02	160.78%	31
38	425	ACUTE ADJUST REACT & DISTURBANCES OF PSYCHOSO	49	460	9.39	7.89	118.98%	73.39
39	88	CHRONIC OBSTRUCTIVE PULMONARY DISEASE	49	489	9.98	6.20	160.96%	185.2
40	362	ENDOSCOPIC TUBAL INTERRUPTION	48	85	1.77	0.98	180.70%	37.96
41	091	SIMPLE PNEUMONIA & PLEURISY 0-17	48	170	3.54	4.92	71.99%	-66.16
42	089	SIMPLE PNEUMONIA & PLEURISY > 17 W CC	47	301	6.40	6.96	92.02%	-26.12
43	254	FX SPRN, STRN & DISL OF UPARM, LOWLEG EX FOOT	46	433	9.41	5.00	188.26%	203
44	082	RESPIRATORY NEOPLASMS	46	428	9.30	7.10	131.05%	101.4
45	198	TOTAL CHOLECYSTECTOMY W/O CDE W/O CC	44	188	4.27	6.54	65.33%	-99.76
46	321	KIDNEY & URINARY TRACT INFECT > 17 W/O CC	44	186	4.23	7.17	58.96%	-129.48
47	373	VAGINAL DELIVERY W/O COMPLICATING DIAGNOSES	42	87	2.07	2.22	93.31%	-6.24
48	248	TENDONITIS, MYOSITIS & BURSITIS	42	397	9.45	8.74	108.15%	29.92
49	178	UNCOMPLICATED PEPTIC ULCER W/O CC	41	109	2.66	4.05	65.64%	-57.05
50	219	LOWER EXTREM & HUMER PROC EXCEPT HIP, FOOT, F	37	283	7.65	4.52	169.22%	115.76
							Total:	-66.61

1 NUM DISPO = NUMBER OF DISPOSITIONS FOR FY 1992
2 BEDDAYS = NUMBER OF OCCUPIED BEDDAYS FOR FY 1992
3 MACH ALOS = AVERAGE LENGTH OF STAY AT MACH FOR FY 1992
4 ISD-A STANDARD = INTERQUAL LENGTH OF STAY STANDARD
5 PERCENT OF ISD-A = (MACH'S ALOS/ISD-A ALOS) x 100
6 # DAYS DIFFERENCE = TOTAL BEDDAYS HIGHER (+) OR LOWER (-) FOR ALL CASES AT MACH FOR THAT DRG FOR FY 1992

Table 1 (continued)

Top 100 DRGs

	DRG CODE	DRG TITLE	NUM DISPO1	BEDDAYS2	MACH ALOS3	ISD-A STANDARD4	PERCENT OF ISD-A5	# DAYS DIFFERENCE6
51	477	NON-EXTENSIVE OR PROCEDURE UNRELATED TO PRINC	35	118	3.37	4.18	80.66%	-28.3
52	361	LAPROSCOPY & INCISIONAL TUBAL INTERRUPTION	32	77	2.41	2.98	80.75%	-18.36
53	025	SEIZURE & HEADACHE > 17 W/O CC	32	238	7.44	3.21	231.70%	135.28
54	247	SIGNS & SYMPTOMS OF MUSCULOSKELETAL SYSTEM &	31	304	9.81	8.38	117.02%	44.22
55	127	HEART FAILURE & SHOCK	31	183	5.90	7.15	82.56%	-38.65
56	430	PSYCHOSES	30	767	25.57	15.90	160.80%	290
57	56	RHINOPLASTY	30	65	2.17	2.12	102.20%	1.4
58	100	RESPIRATORY SIGNS & SYMPTOMS W/O CC	29	56	1.93	2.41	80.13%	-13.89
59	139	CARDIAC ARRHYTHMIA & CONDUCTION DISORDERS W/O	29	116	4.00	3.23	123.84%	22.33
60	098	BRONCHITIS & ASTHMA 0-17	28	74	2.64	3.05	86.65%	-11.4
61	468	EXTENSIVE OR PROC UNRELATED TO PRINCIPAL DIAG	28	238	8.50	4.83	175.98%	102.76
62	356	FEMALE REPRODUCTIVE SYSTEM RECONSTRUCTIVE PRO	26	174	6.69	4.40	152.10%	59.6
63	167	APPENDECTOMY W/O COMPLICATED PRINCIPAL DIAG W	25	133	5.32	2.57	207.00%	68.75
64	294	DIABETES > 35	25	136	5.44	7.20	75.56%	-44
65	358	UTERUS & ADENEXA PROC FOR NON-MALIGNANCY W CC	23	138	6.00	4.34	138.25%	38.18
66	188	OTHER DIGESTOVE SYSTEM DIAGNOSES > 17 W CC	23	29	1.26	5.33	23.66%	-93.59
67	158	ANAL AND STOMAL PROCEDURES W/O CC	23	146	6.35	2.97	213.73%	77.69
68	160	HERNIA PROCEDURES EXCEPT INGUINAL & FEMORAL >	23	94	4.09	3.85	106.15%	5.45
69	063	OTHER EAR NOSE MOUTH & THROAT OR PROCEDURES	22	151	6.86	2.77	247.78%	90.06
70	297	NUTRITIONAL & MISC METABOLIC DISORDERS > 17 W	22	41	1.86	4.31	43.24%	-53.82
71	140	ANGINA PECTORIS	21	66	3.14	3.88	81.00%	-15.48
72	901	ALC/DRUG ABUSE OR DEPEND, DETOX OR OTH SYMPT	21	276	13.14	9.11	144.27%	84.69
73	368	INFECTIONS, FEMALE REPRODUCTIVE SYSTEM	20	145	7.25	4.46	162.56%	55.8
74	232	ARTHROSCOPY	20	150	7.50	6.03	124.38%	29.4
75	281	TRAUMA TO SKIN, SUBCUT TISS & BREAST >17 W/O	20	133	6.65	3.47	191.64%	63.6
76	102	OTHER RESPIRATORY SYSTEM DIAGNOSES W/O CC	20	54	2.70	3.32	81.33%	-12.4
77	122	CIRCULATORY DISORDERS W AMI W/O CV COMP DISCH	20	80	4.00	7.16	55.87%	-63.2
78	014	SPECIFIC CEREBROVASCULAR DISORDERS EXC TIA	20	123	6.15	10.02	61.38%	-77.4
79	169	MOUTH PROCEDURES W/O CC	20	46	2.30	2.65	86.79%	-7
80	055	MISC EAR, NOSE & THROAT PROCEDURES	19	29	1.53	1.76	86.72%	-4.44
81	138	CARDIAC ARRHYTHMIA & CONDUCTION DISORDER W CC	19	95	5.00	5.14	97.28%	-2.66
82	350	INFLAMMATION OF THE MALE REPRODUCTIVE SYSTEM	19	123	6.47	5.44	119.00%	19.64
83	320	KIDNEY & URINARY TRACT INFECTIONS > 17 W CC	19	93	4.89	7.04	69.53%	-40.76
84	339	TESTES PROCEDURES, NON-MALIGNANCY >17	19	67	3.53	2.92	120.76%	11.52
85	019	CRANIAL & PERIPHERAL NERVE DISORDERS W/O CC	19	320	16.84	10.85	155.23%	113.85
86	276	NON-MALIGNANT BREAST DISORDER	19	27	1.42	3.31	42.93%	-35.89
87	324	URINARY STONES W/O CC	19	56	2.95	2.47	119.33%	9.07
88	172	DIGESTIVE MALIGNANCY W CC	18	264	14.67	8.78	167.05%	105.96
89	132	ATHEROSCLEROSIS W CC	18	189	10.50	3.49	300.86%	126.18
90	204	DISORDERS OF PANCREAS EXCEPT MALIGNANCY	18	106	5.89	8.44	69.77%	-45.92
91	234	OTHER MUSCULOSKELETAL & CONN TISS OR PROC W/O	18	145	8.06	3.91	206.02%	74.62
92	174	G.I. HEMORRHAGE W CC	17	93	5.47	5.30	103.22%	2.9
93	125	CIRC DISORDER EXC AMI, W CARD CATH W/O COMPLE	17	82	4.82	3.32	145.29%	25.56
94	185	DENTAL & ORAL DIS EXCEPT EXTRACT & RESTOR > 1	17	58	3.41	4.09	83.42%	-11.53
95	029	TRAUMATIC STUPOR & COMA, COMA > 1 HR W/O CC	17	43	2.53	5.88	43.02%	-56.96
96	224	SHOULDER, ELBOW OR FOREARM PROC, EXC MAJOR JN	17	172	10.12	5.95	170.04%	70.85
97	279	CELLULITIS 0-17	17	56	3.29	6.08	54.18%	-47.36
98	395	RED BLOOD CELL DISORDERS > 17	16	65	4.06	4.90	82.91%	-13.4
99	006	CARPAL TUNNEL RELEASE	16	84	5.25	1.07	490.65%	66.88
100	119	VEIN LIGATION & STRIPPING	16	65	4.06	3.47	117.07%	9.48
							Total:	1069.31
							Grand Total:	1069.31

1 NUM DISPO = NUMBER OF DISPOSITIONS FOR FY 1992
2 BEDDAYS = NUMBER OF OCCUPIED BEDDAYS FOR FY 1992
3 MACH ALOS = AVERAGE LENGTH OF STAY AT MACH FOR FY 1992
4 ISD-A STANDARD = INTERQUAL LENGTH OF STAY STANDARD
5 PERCENT OF ISD-A = (MACH'S ALOS/ISD-A ALOS) x 100
6 # DAYS DIFFERENCE = TOTAL BEDDAYS HIGHER (+) OR LOWER (-) FOR ALL CASES AT MACH FOR THAT DRG FOR FY 1992

Table 2

DRGs that Exceed ISD-A Standard

	DRG CODE	DRG TITLE	NUM DISPO	BEDDAYS	MACH ALOS	ISD-A STANDARD	DIFFERENCE PER DISPO
1	006	CARPAL TUNNEL RELEASE	16	84	5.25	1.07	4.18
2	025	SEIZURE & HEADACHE > 17 W/O CC	32	238	7.44	3.21	4.23
3	039	LENS PROCEDURES W OR W/O VITRECTOMY	107	213	1.99	1.01	0.98
4	056	RHINOPLASTY	30	65	2.17	2.12	0.05
5	060	TONSILLECTOMY &/OR ADENOIDECTOMY ONLY, AGE 0-17	50	82	1.64	1.02	0.62
6	063	OTHER EAR NOSE MOUTH & THROAT OR PROCEDURES	22	151	6.86	2.77	4.09
7	082	RESPIRATORY NEOPLASMS	46	428	9.30	7.10	2.20
8	088	CHRONIC OBSTRUCTIVE PULMONARY DISEASE	49	489	9.98	6.20	3.78
9	119	VEIN LIGATION & STRIPPING	16	65	4.06	3.47	0.59
10	132	ATHEROSCLEROSIS W CC	18	189	10.50	3.49	7.01
11	139	CARDIAC ARRHYTHMIA & CONDUCTION DISORDERS W/O CC	29	116	4.00	3.23	0.77
12	158	ANAL AND STOMAL PROCEDURES W/O CC	23	146	6.35	2.97	3.38
13	160	HERNIA PROCEDURES EXCEPT INGUINAL & FEMORAL >17 W/	23	94	4.09	3.85	0.24
14	162	INGUINAL & FEMORAL HERNIA PROCEDURES AGE >17 W/O C	88	563	6.40	2.51	3.89
15	167	APPENDECTOMY W/O COMPLICATED PRINCIPAL DIAG W/O CC	25	133	5.32	2.57	2.75
16	172	DIGESTIVE MALIGNANCY W CC	18	264	14.67	8.78	5.89
17	174	G.I. HEMORRHAGE W CC	17	93	5.47	5.30	0.17
18	182	ESOPHAGITIS, GASTROENT, & MISC DIGEST DISORDERS AG	126	555	4.40	3.37	1.03
19	187	DENTAL EXTRACTIONS & RESTORATIONS	311	577	1.86	1.50	0.36
20	219	LOWER EXTREM & HUMER PROC EXCEPT HIP, FOOT, FEMUR	37	283	7.65	4.52	3.13
21	222	KNEE PROCEDURES W/O CC	152	995	6.55	3.55	3.00
22	224	SHOULDER, ELBOW OR FOREARM PROC, EXC MAJOR JNT PRO	17	172	10.12	5.95	4.17
23	229	HAND OR WRIST PROC, EXCEPT MAJOR JOINT PROC, W/O C	76	205	2.70	1.94	0.76
24	231	LOCAL EXCISION & REMOVAL OF INT FIX DEVICES EXCEPT	162	1108	6.84	3.65	3.19
25	232	ARTHROSCOPY	20	150	7.50	6.03	1.47
26	234	OTHER MUSCULOSKELETAL & CONN TISS OR PROC W/O CC	18	145	8.06	3.91	4.15
27	239	PATH FRACTURES & MUSCULOSKELETAL & CONN TISS MALIG	66	1231	18.65	9.02	9.63
28	243	MEDICAL BACK PROBLEMS	69	600	8.70	4.45	4.25
29	247	SIGNS & SYMPTOMS OF MUSCULOSKELETAL SYSTEM & CONN	31	304	9.81	8.38	1.43
30	249	TENDONITIS, MYOSITIS & BURSITIS	42	397	9.45	8.74	0.71
31	254	FX SPRN, STRN & DISL OF UPARM, LOWLEG EX FOOT >17	46	433	9.41	5.00	4.41
32	256	OTHER MUSCULOSKELETAL SYSTEM & CONN TISSUE DIAGNOS	64	618	9.66	5.27	4.39
33	262	BREAST BIOPSY & LOCAL EXCISION FOR NON-MALIGNANCY	64	115	1.80	1.74	0.06
34	270	OTHER SKIN, SUBCUT TISS & BREAST OR PROC W/O CC	62	212	3.42	3.09	0.33
35	281	TRAUMA TO SKIN, SUBCUT TISS & BREAST >17 W/O CC	20	133	6.65	3.47	3.18
36	324	URINARY STONES W/O CC	19	56	2.95	2.47	0.48
37	339	TESTES PROCEDURES, NON-MALIGNANCY >17	19	67	3.53	2.92	0.61
38	350	INFLAMMATION OF THE MALE REPRODUCTIVE SYSTEM	19	123	6.47	5.44	1.03
39	356	FEMALE REPRODUCTIVE SYSTEM RECONSTRUCTIVE PROCEDUR	26	174	6.69	4.40	2.29
40	358	UTERUS & ADENEXA PROC FOR NON-MALIGNANCY W CC	23	138	6.00	4.34	1.66
41	359	UTERUS & ADENEXA PROC FOR NON-MALIGNANCY W/O CC	86	430	5.00	3.89	1.11
42	362	ENDOSCOPIC TUBAL INTERRUPTION	48	85	1.77	0.98	0.79
43	368	INFECTIONS, FEMALE REPRODUCTIVE SYSTEM	20	145	7.25	4.46	2.79
44	369	MENSTRUAL & OTHER FEMALE REPRO SYSTEM DISORDERS	53	233	4.40	2.66	1.74
45	410	CHEMOTHERAPY	75	288	3.84	3.26	0.58
46	425	ACUTE ADJUST REACT & DISTURBANCES OF PSYCHOSOCIAL	49	460	9.39	7.89	1.50
47	426	DEPRESSIVE NEUROSES	51	427	8.37	7.80	0.57
48	427	NEUROSES EXCEPT DEPRESSIVE	130	1005	7.73	7.38	0.35
49	430	PSYCHOSES	30	767	25.57	15.90	9.67
50	468	EXTENSIVE OR PROC UNRELATED TO PRINCIPAL DIAGNOSIS	28	238	8.50	4.83	3.67
51	901	ALC/DRUG ABUSE OR DEPEND, DETOX OR OTH SYMPT TREAT	21	276	9.12	9.11	0.01

Study Design

ALOS for the top 100 DRGs were compared with the ISD-A standards. The critical probability level (α) = 0.05. Percentile values for student's t distribution were obtained from Spiegel (1975). Computations of lengths of stay for particular admission diagnoses that exceed ISD-A standards by a statistically significant difference were calculated into total variance days. A variance day was defined as a day that exceeds InterQual criteria for that diagnosis. The total variance days for that diagnosis was defined as the total number of variance days for one year for all cases with that diagnosis.

Total variance days were rank-ordered, providing data on those diagnoses that are most apt to benefit from individual case management.

Total variance days were also converted into dollars lost per admission diagnosis. Data provided by MACH's Resource Management Division (RMD) of average dollars expended per variance day were multiplied by the admission diagnosis total variance to provide a figure of unnecessary dollars expended per admission diagnosis. While unnecessary dollars expended per admission diagnosis may vary with different diagnoses,

it is beyond the scope of this paper and the ability of the RMD to track these variable costs; thus, average dollars expended were used.

The study is considered reliable, since it uses data that are coded and reported per policies and regulations of Health Services Command. There may be a potential threat to validity, since the demographics of the MACH population base may be different from the national population base. However, threats to validity were controlled by using InterQual ISD-A data, which provides adjustments for age, gender, co-morbidities and intensity of illness.

Statistical Analysis

A detailed analysis of the 51 DRGs that exceed ISD-A criteria follows; the data is presented in tabular form in Table 3 on page 18.

Table 3

Statistical Analysis: 51 of Top 100 DRGs

DRG CODE	NUM DISPO	BEDDAYS	ACTUAL ALOS	EXPECTED ALOS	MEDIAN	STANDARD DEVIAT	MIN	MAX	t-Test	0.05 T LEVELS	STAT SIG/ NOT SS	TOTAL VAR DAYS
006	16	84	5.25	1.07	1.00	14.37	1.00	59.00	1.1635	1.75	NOT SS	NA
025	32	238	7.44	3.21	3.00	10.86	0.00	54.00	2.2021	1.70	STAT SIG	135.28
039	107	213	1.99	1.01	2.00	1.44	1.00	14.00	7.0444	1.67	STAT SIG	104.93
056	30	65	2.17	2.12	2.00	2.00	1.00	10.00	0.1278	1.70	NOT SS	NA
060	50	82	1.64	1.02	1.00	0.85	1.00	4.00	5.1577	1.68	STAT SIG	31
063	22	151	6.86	2.77	5.50	9.20	1.00	50.00	2.0870	1.72	STAT SIG	90.06
082	46	428	9.30	7.10	5.00	9.87	1.00	49.00	1.5148	1.68	NOT SS	NA
088	49	489	9.98	6.20	7.00	9.94	1.00	57.00	2.6617	1.68	STAT SIG	185.2
119	16	65	4.06	3.47	3.00	1.82	1.00	9.00	1.3022	1.75	NOT SS	NA
132	18	189	10.50	3.49	2.00	28.94	1.00	129.00	1.0277	1.73	NOT SS	NA
139	29	116	4.00	3.23	2.00	5.01	0.00	22.00	0.8277	1.70	NOT SS	NA
158	23	146	6.35	2.97	4.00	6.23	1.00	28.00	2.6002	1.71	STAT SIG	77.69
160	23	94	4.09	3.85	3.00	2.43	1.00	12.00	0.4677	1.71	NOT SS	NA
162	88	563	6.40	2.51	5.00	7.08	1.00	50.00	5.1511	1.67	STAT SIG	342.12
167	25	133	5.32	2.57	5.00	2.86	2.00	15.00	4.8077	1.71	STAT SIG	68.75
172	18	264	14.67	8.78	9.50	14.85	1.00	49.00	1.6818	1.73	NOT SS	NA
174	17	93	5.47	5.30	3.50	7.76	0.00	35.00	0.0906	1.74	NOT SS	NA
182	126	555	4.40	3.37	2.00	6.53	1.00	55.00	1.7787	1.66	STAT SIG	130.38
187	311	577	1.86	1.50	1.50	2.87	1.00	50.00	2.1832	1.66	STAT SIG	110.5
219	37	283	7.65	4.52	4.00	13.23	1.00	78.00	1.4385	1.70	NOT SS	NA
222	152	995	6.55	3.55	3.00	10.54	1.00	64.00	3.5045	1.66	STAT SIG	455.4
224	17	172	10.12	5.95	4.00	15.51	1.00	65.00	1.1079	1.74	NOT SS	NA
229	76	205	2.70	1.94	2.00	2.30	1.00	15.00	2.8707	1.67	STAT SIG	57.56
231	162	1108	6.84	3.65	3.00	13.47	1.00	89.00	3.0138	1.66	STAT SIG	516.7
232	20	150	7.50	6.03	4.00	10.69	1.00	45.00	0.6150	1.72	NOT SS	NA
234	18	145	8.06	3.91	4.00	14.68	1.00	63.00	1.1981	1.73	NOT SS	NA
239	66	1231	18.65	9.02	14.00	17.67	0.00	74.00	4.4282	1.67	STAT SIG	635.68
243	69	600	8.70	4.45	4.00	13.28	0.00	62.00	2.6557	1.67	STAT SIG	292.95
247	31	304	9.81	8.38	4.00	13.24	0.00	62.00	0.5999	1.70	NOT SS	NA
249	42	397	9.45	8.74	1.50	0.71	1.00	2.00	6.5025	1.68	STAT SIG	29.92
254	46	433	9.41	5.00	3.00	12.97	0.00	72.00	2.3077	1.68	STAT SIG	203
256	64	618	9.66	5.27	5.00	11.19	0.00	43.00	3.1358	1.67	STAT SIG	280.72
262	64	115	1.80	1.74	1.00	1.33	1.00	7.00	0.3421	1.67	NOT SS	NA
270	62	212	3.42	3.09	2.00	5.64	1.00	45.00	0.4598	1.67	NOT SS	NA
281	20	133	6.65	3.47	3.50	8.30	1.00	39.00	1.7134	1.72	NOT SS	NA
324	19	56	2.95	2.47	2.00	3.41	0.00	16.00	0.6102	1.73	NOT SS	NA
339	19	67	3.53	2.92	2.00	2.69	2.00	13.00	0.9825	1.73	NOT SS	NA
350	19	123	6.47	5.44	4.00	7.39	1.00	33.00	0.6097	1.73	NOT SS	NA
356	26	174	6.69	4.40	7.00	2.28	2.00	11.00	5.1265	1.71	STAT SIG	59.6
358	23	138	6.00	4.34	6.00	1.88	2.00	10.00	4.2346	1.71	STAT SIG	38.18
359	86	430	5.00	3.89	5.00	3.55	0.00	34.00	2.8996	1.67	STAT SIG	95.46
362	48	85	1.77	0.98	1.00	0.98	1.00	5.00	5.5909	1.68	STAT SIG	37.96
368	20	145	7.25	4.46	5.00	7.35	1.00	30.00	1.6976	1.72	NOT SS	NA
369	53	233	4.40	2.66	3.00	3.71	1.00	17.00	3.4070	1.68	STAT SIG	92.02
410	75	288	3.84	3.26	4.00	2.42	1.00	21.00	2.0756	1.67	STAT SIG	43.5
425	49	460	9.39	7.89	4.00	10.74	0.00	39.00	0.9762	1.68	NOT SS	NA
426	51	427	8.37	7.80	5.00	7.96	0.00	39.00	0.5137	1.68	NOT SS	NA
427	130	1005	7.73	7.38	5.00	6.35	1.00	31.00	0.6298	1.66	NOT SS	NA
430	30	767	25.57	15.90	25.00	25.06	1.00	121.00	2.1128	1.70	STAT SIG	290
468	28	238	8.50	4.83	2.00	13.21	0.00	45.00	1.4701	1.70	NOT SS	NA
901	21	276	9.12	9.11	4.00	10.63	1.00	44.00	0.0043	1.72	NOT SS	NA
											Total:	4404.56

DRG 063

A sample of 22 lengths of stay for a disposition of DRG 063, (other ear nose mouth & throat operating room procedures) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 063 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 063 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 6.86, standard deviation = 9.20. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (22-1) = 21. The t test revealed that $p < \alpha$, $t(21) = 2.0870.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a

statistically significant difference between MACH's length of stay for DRG 063 versus the ISD-A standard. The t test results are $t(21) = 2.0870$, $p < \alpha$.

DRG 158

A sample of 23 lengths of stay for a disposition of DRG 158, (anal and stomal procedures without complications)) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 158 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 158 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 6.35, standard deviation = 6.23. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (23-1) = 22. The t test revealed that $p < \alpha$, $t(22) = 2.6002.$, p

< 0.05. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 158 versus the ISD-A standard. The t test results are $t(22) = 2.6002$, $p < \alpha$.

DRG 358

lengths of stay for a disposition of DRG 358, (uterus and adnexa procedure for non-malignancy with complications) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 358 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 358 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 6.00, standard deviation = 1.88. A hypothesis test for means was conducted using

PlanPerfect. The degrees of freedom were n-1 (23-1) = 22. The t test revealed that $p < \alpha$, $t(22) = 4.2346.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 358 versus the ISD-A standard. The t test results are $t(22) = 4.2346$, $p < \alpha$.

DRG 167

A sample of 25 lengths of stay for a disposition of DRG 167, (appendectomy without complicated principal diagnosis and without complications) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 167 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 167 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with

PlanPerfect and the results are attached in table 3: mean = 5.32, standard deviation = 2.86. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (25-1) = 24. The *t* test revealed that $p < \alpha$, $t(24) = 4.8077.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 167 versus the ISD-A standard. The *t* test results are $t(24) = 4.8077$, $p < \alpha$.

DRG 356

A sample of 26 lengths of stay for a disposition of DRG 356, (female reproductive system reconstructive procedures) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 356 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 356 compared

to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 6.69, standard deviation = 2.28. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (26-1) = 25. The t test revealed that $p < \alpha$, $t(25) = 5.1265.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 356 versus the ISD-A standard. The t test results are $t(25) = 5.1265$, $p < \alpha$.

DRG 430

A sample of 30 lengths of stay for a disposition of DRG 430, (psychoses) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 430 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between

MACH's lengths of stay for the disposition of DRG 430 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 25.57, standard deviation = 25.06. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (30-1) = 29. The t test revealed that $p < \alpha$, $t(29) = 2.1128.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 430 versus the ISD-A standard. The t test results are $t(29) = 2.1128$, $p < \alpha$.

DRG 025

A sample of 32 lengths of stay for a disposition of DRG 025, (seizure and headache age > 17 without complications)) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 025

compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 025 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 7.44, standard deviation = 10.86. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (32-1) = 31. The *t* test revealed that $p < \alpha$, $t(31) = 2.2021$., $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 025 versus the ISD-A standard. The *t* test results are $t(31) = 2.2021$, $p < \alpha$.

DRG 249

A sample of 42 lengths of stay for a disposition of DRG 249, (tendinitis, myositis and bursitis) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically

significant difference between MACH's lengths of stay for the disposition of DRG 249 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 249 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 9.45, standard deviation = 0.71. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (42-1) = 41. The t test revealed that $p < \alpha$, $t(41) = 6.5025.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 249 versus the ISD-A standard. The t test results are $t(41) = 6.5025$, $p < \alpha$.

DRG 254

A sample of 46 lengths of stay for a disposition of DRG 254, (fracture of sternum and dislocation of upper arm, lower leg except foot age > 17 without complications) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number

of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 254 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 254 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 9.41, standard deviation = 12.97. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (46-1) = 45. The t test revealed that $p < \alpha$, $t(45) = 2.3077$., $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 254 versus the ISD-A standard. The t test results are $t(45) = 2.3077$, $p < \alpha$.

DRG 362

A sample of 48 lengths of stay for a disposition of DRG 362, (endoscopic tubal interruption) at MACH was

extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 362 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 362 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 1.77, standard deviation = 0.98. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (48-1) = 47. The t test revealed that $p < \alpha$, $t(47) = 5.5909.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 362 versus the ISD-A standard. The t test results are $t(47) = 5.5909$, $p < \alpha$.

DRG 088

A sample of 49 lengths of stay for a disposition of DRG 088, (chronic obstructive pulmonary disease) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 088 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 088 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 9.98, standard deviation = 9.94. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (49-1) = 48. The t test revealed that $p < \alpha$, $t(48) = 2.6617.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's

length of stay for DRG 088 versus the ISD-A standard. The t test results are $t(48) = 2.6617$, $p < \alpha$.

DRG 060

A sample of 50 lengths of stay for a disposition of DRG 060, (tonsillectomy and/or adenoidectomy only, age 0 - 17) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 060 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 060 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 1.64, standard deviation = 0.85. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (50-1) = 49. The t test revealed that $p < \alpha$, $t(49) = 5.1577.$, $p < 0.05$. Thus, the null hypothesis is rejected and the

alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 060 versus the ISD-A standard. The t test results are $t(49) = 5.5177$, $p < \alpha$.

DRG 369

A sample of 53 lengths of stay for a disposition of DRG 369, (menstrual and other female reproductive system disorders) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 369 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 369 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 4.40, standard deviation = 3.71. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (53-1) =

52. The t test revealed that $p < \alpha$, $t(52) = 3.4070$., $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 369 versus the ISD-A standard. The t test results are $t(52) = 3.4070$, $p < \alpha$.

DRG 256

A sample of 64 lengths of stay for a disposition of DRG 256, (other musculoskeletal system and connective tissue diagnoses) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 256 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 256 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 9.66, standard deviation =

11.19. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (64-1) = 63. The t test revealed that $p < \alpha$, $t(63) = 3.1358.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 256 versus the ISD-A standard. The t test results are $t(63) = 3.1358$, $p < \alpha$.

DRG 239

A sample of 66 lengths of stay for a disposition of DRG 239, (pathologic fractures and musculoskeletal and connective tissue malignancy) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 239 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 239 compared to the ISD-A standard lengths of stay. The critical probability level (α) =

0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 18.65, standard deviation = 17.67. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (66-1) = 65. The t test revealed that $p < \alpha$, $t(65) = 4.4282.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 239 versus the ISD-A standard. The t test results are $t(65) = 4.4282$, $p < \alpha$.

DRG 243

A sample of 69 lengths of stay for a disposition of DRG 243, (medical back problems) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 243 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the

disposition of DRG 243 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 8.70, standard deviation = 13.28. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (69-1) = 68. The t test revealed that $p < \alpha$, $t(68) = 2.6557.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 243 versus the ISD-A standard. The t test results are $t(68) = 2.6557$, $p < \alpha$.

DRG 410

A sample of 75 lengths of stay for a disposition of DRG 410, (chemotherapy) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 410 compared to the ISD-A standard length of stay. The alternate hypothesis states that

there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 410 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 3.84, standard deviation = 2.42. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (75-1) = 74. The t test revealed that $p < \alpha$, $t(74) = 2.0756.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 410 versus the ISD-A standard. The t test results are $t(74) = 2.0756$, $p < \alpha$.

DRG 229

A sample of 76 lengths of stay for a disposition of DRG 229, (hand or wrist procedures, except major joint procedures, without complications) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically

significant difference between MACH's lengths of stay for the disposition of DRG 229 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 229 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 2.70, standard deviation = 2.30. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (76-1) = 75. The t test revealed that $p < \alpha$, $t(75) = 2.8707.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 229 versus the ISD-A standard. The t test results are $t(75) = 2.8707$, $p < \alpha$.

DRG 359

A sample of 86 lengths of stay for a disposition of DRG 359, (uterus and adnexa procedure for non-malignancy without complications) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous).

The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 359 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 359 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 5.00, standard deviation = 3.55. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (86-1) = 85. The t test revealed that $p < \alpha$, $t(85) = 2.8996.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 359 versus the ISD-A standard. The t test results are $t(85) = 2.8996$, $p < \alpha$.

DRG 162

A sample of 88 lengths of stay for a disposition of DRG 162, (inguinal and femoral hernia procedures age >

17 without complications) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 162 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 162 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 6.40, standard deviation = 7.08. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (88-1) = 87. The t test revealed that $p < \alpha$, $t(87) = 5.1511.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 162 versus the ISD-A standard. The t test results are $t(87) = 5.1511$, $p < \alpha$.

DRG 039

A sample of 107 lengths of stay for a disposition of DRG 039, (lens procedures with or without vitrectomy) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 039 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 039 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 1.99, standard deviation = 1.44. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (107-1) = 106. The t test revealed that $p < \alpha$, $t(106) = 7.0444$., $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between

MACH's length of stay for DRG 107 versus the ISD-A standard. The t test results are $t(106) = 7.0444$, $p < \alpha$.

DRG 182

A sample of 126 lengths of stay for a disposition of DRG 182, (esophagitis, gastroenteritis, and miscellaneous digestive disorders age > 17) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 182 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 182 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 4.40, standard deviation = 6.53. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (126-1) = 125. The t test

revealed that $p < \alpha$, $t(125) = 1.7787.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 182 versus the ISD-A standard. The t test results are $t(125) = 1.7787$, $p < \alpha$.

DRG 222

A sample of 152 lengths of stay for a disposition of DRG 222, (knee procedures without complications) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 222 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 222 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 6.55, standard deviation = 10.54. A

hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (152-1) = 151. The t test revealed that $p < \alpha$, $t(151) = 3.5045.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 222 versus the ISD-A standard. The t test results are $t(151) = 3.5045$, $p < \alpha$.

DRG 231

A sample of 162 lengths of stay for a disposition of DRG 231, (local excision and removal of internal fix devices except hip) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 231 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 231 compared to the ISD-A standard lengths of stay. The

critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 6.84, standard deviation = 13.47. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (162-1) = 161. The *t* test revealed that $p < \alpha$, $t(161) = 3.0138.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 231 versus the ISD-A standard. The *t* test results are $t(161) = 3.0138$, $p < \alpha$.

DRG 187

A sample of 311 lengths of stay for a disposition of DRG 187, (dental extractions and restorations) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 187 compared to the ISD-A standard length of stay. The alternate hypothesis states that there is a statistically

significant difference between MACH's lengths of stay for the disposition of DRG 187 compared to the ISD-A standard lengths of stay. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 1.86, standard deviation = 2.87. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (311-1) = 310. The t test revealed that $p < \alpha$, $t(310) = 2.1832.$, $p < 0.05$. Thus, the null hypothesis is rejected and the alternate hypothesis is accepted, indicating there is a statistically significant difference between MACH's length of stay for DRG 187 versus the ISD-A standard. The t test results are $t(310) = 2.1832$, $p < \alpha$.

DRG 006

A sample of 16 lengths of stay for a disposition of DRG 006, (carpal tunnel release) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay

for the disposition of DRG 006 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 006 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 5.25, standard deviation = 14.37. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (16-1) = 15. The t test revealed that $p > \alpha$, $t(15) = 1.1635$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 006 versus the ISD-A standard. The t test results are $t(15) = 1.1635$, $p > \alpha$.

DRG 119

A sample of 16 lengths of stay for a disposition of DRG 119, (vein ligation and stripping) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically

significant difference between MACH's lengths of stay for the disposition of DRG 119 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 119 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 4.06, standard deviation = 1.82. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (16-1) = 15. The t test revealed that $p > \alpha$, $t(15) = 1.3022$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 119 versus the ISD-A standard. The t test results are $t(15) = 1.3022$, $p > \alpha$.

DRG 174

A sample of 17 lengths of stay for a disposition of DRG 174, (G.I. hemorrhage with complications) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The

null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 174 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 174 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 5.47, standard deviation = 7.76. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (16-1) = 15. The t test revealed that $p > \alpha$, $t(15) = 0.0906$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 174 versus the ISD-A standard. The t test results are $t(15) = 0.0906$, $p > \alpha$.

DRG 224

A sample of 17 lengths of stay for a disposition of DRG 224, (shoulder, elbow or forearm procedure, except major joint procedure, without complications) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized

(continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 224 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 224 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 10.12, standard deviation = 15.51. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (17-1) = 16. The t test revealed that $p > \alpha$, $t(16) = 1.1079$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 224 versus the ISD-A standard. The t test results are $t(16) = 1.1079$, $p > \alpha$.

DRG 172

A sample of 18 lengths of stay for a disposition of DRG 172, (digestive malignancy with complications) at MACH was extracted from the PASBA2 database. The

dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 172 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 172 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 14.67, standard deviation = 14.85. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (18-1) = 17. The t test revealed that $p > \alpha$, $t(17) = 1.6818$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 172 versus the ISD-A standard. The t test results are $t(17) = 1.6818$, $p > \alpha$.

DRG 132

A sample of 18 lengths of stay for a disposition of DRG 132, (atherosclerosis with complications) at MACH

was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 132 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 132 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 10.50, standard deviation = 28.94. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (18-1) = 17. The t test revealed that $p > \alpha$, $t(17) = 1.0277$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 132 versus the ISD-A standard. The t test results are $t(17) = 1.0277$, $p > \alpha$.

DRG 234

A sample of 18 lengths of stay for a disposition of

DRG 234, (other musculoskeletal and connective tissue operating procedures without complications) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 234 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 234 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 8.06, standard deviation = 14.68. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (18-1) = 17. The t test revealed that $p > \alpha$, $t(17) = 1.1981$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 234 versus the ISD-A standard. The t test results are $t(17) = 1.1981$, $p > \alpha$.

DRG 339

A sample of 19 lengths of stay for a disposition of DRG 339, (testes procedures, non-malignancy, age > 17) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 339 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 339 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 3.53, standard deviation = 2.69. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (19-1) = 18. The t test revealed that $p > \alpha$, $t(18) = 0.9825$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 339

versus the ISD-A standard. The *t* test results are $t(18) = 0.9825$, $p > \alpha$.

DRG 350

A sample of 19 lengths of stay for a disposition of DRG 350, (inflammation of the male reproductive system) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 350 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 350 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 6.47, standard deviation = 7.39. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (19-1) = 18. The *t* test revealed that $p > \alpha$, $t(18) = 0.6097$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant

difference between MACH's length of stay for DRG 350 versus the ISD-A standard. The t test results are $t(18) = 0.6097$, $p > \alpha$.

DRG 324

A sample of 19 lengths of stay for a disposition of DRG 324, (urinary stones without complications) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 324 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 324 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 2.95, standard deviation = 3.41. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (19-1) = 18. The t test revealed that $p > \alpha$, $t(18) = 0.6102$, $p > 0.05$. Thus, the null hypothesis is not rejected,

indicating there is not a statistically significant difference between MACH's length of stay for DRG 324 versus the ISD-A standard. The *t* test results are $t(18) = 0.6102$, $p > \alpha$.

DRG 368

A sample of 20 lengths of stay for a disposition of DRG 368, (infections, female reproductive system) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 368 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 368 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 7.25, standard deviation = 7.35. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (20-1) = 19. The *t* test revealed that $p > \alpha$, $t(19) = 1.6976$, p

> 0.05. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 368 versus the ISD-A standard. The t test results are $t(19) = 1.6976$, $p > \alpha$.

DRG 232

A sample of 20 lengths of stay for a disposition of DRG 232, (arthroscopy) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 232 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 232 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 7.50, standard deviation = 10.69. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (20-1) = 19. The t test

revealed that $p > \alpha$, $t(19) = 0.6150$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 232 versus the ISD-A standard. The t test results are $t(19) = 0.6150$, $p > \alpha$.

DRG 281

A sample of 20 lengths of stay for a disposition of DRG 281, (trauma to skin, subcutaneous tissue and breast, age > 17 without complications) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 281 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 281 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 6.65, standard deviation =

8.30. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (20-1) = 19. The t test revealed that $p > \alpha$, $t(19) = 1.7134$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 281 versus the ISD-A standard. The t test results are $t(19) = 1.7134$, $p > \alpha$.

DRG 901

A sample of 21 lengths of stay for a disposition of DRG 901, (alcohol/drug abuse or dependency, detoxification or other symptomatic treatment, age > 21) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 901 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 901 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics

were computed with PlanPerfect and the results are attached in table 3: mean = 9.12, standard deviation = 10.63. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (21-1) = 20. The *t* test revealed that $p > \alpha$, $t(20) = 0.0043$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 901 versus the ISD-A standard. The *t* test results are $t(20) = 0.0043$, $p > \alpha$.

DRG 160

A sample of 23 lengths of stay for a disposition of DRG 160, (hernia procedures except inguinal and femoral, age > 17 without complications) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 160 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 160

compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 4.09, standard deviation = 2.43. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (23-1) = 22. The *t* test revealed that $p > \alpha$, $t(22) = 0.4677$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 160 versus the ISD-A standard. The *t* test results are $t(22) = 0.4677$, $p > \alpha$.

DRG 468

A sample of 28 lengths of stay for a disposition of DRG 468, (extensive operating room procedure unrelated to principal diagnosis) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 468 compared to the ISD-A standard. The alternate hypothesis states that there is a

statistically significant difference between MACH's lengths of stay for the disposition of DRG 468 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 8.50, standard deviation = 13.21. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (28-1) = 27. The *t* test revealed that $p > \alpha$, $t(27) = 1.4701$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 468 versus the ISD-A standard. The *t* test results are $t(27) = 1.4701$, $p > \alpha$.

DRG 139

A sample of 29 lengths of stay for a disposition of DRG 139, (cardiac arrhythmia and conduction disorders without complications) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the

disposition of DRG 139 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 139 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 4.00, standard deviation = 5.01. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (29-1) = 28. The t test revealed that $p > \alpha$, $t(28) = 0.8277$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 139 versus the ISD-A standard. The t test results are $t(28) = 0.8277$, $p > \alpha$.

DRG 056

A sample of 30 lengths of stay for a disposition of DRG 056, (rhinoplasty) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant

difference between MACH's lengths of stay for the disposition of DRG 056 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 056 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 2.17, standard deviation = 2.00. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (30-1) = 29. The t test revealed that $p > \alpha$, $t(29) = 0.1278$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 056 versus the ISD-A standard. The t test results are $t(29) = 0.1278$, $p > \alpha$.

DRG 247

A sample of 31 lengths of stay for a disposition of DRG 247, (signs and symptoms of musculoskeletal system and connective tissue disorder) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous).

The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 247 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 247 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 9.81, standard deviation = 13.24. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (31-1) = 30. The t test revealed that $p > \alpha$, $t(30) = 0.5999$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 247 versus the ISD-A standard. The t test results are $t(30) = 0.5999$, $p > \alpha$.

DRG 219

A sample of 37 lengths of stay for a disposition of DRG 219, (lower extremity and humerus procedure except hip, foot and femur age > 17) at MACH was extracted

from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 219 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 219 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 7.65, standard deviation = 13.23. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (37-1) = 36. The t test revealed that $p > \alpha$, $t(36) = 1.4385$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 219 versus the ISD-A standard. The t test results are $t(36) = 1.4385$, $p > \alpha$.

DRG 082

A sample of 46 lengths of stay for a disposition of

DRG 082, (respiratory neoplasms) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 082 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 082 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 9.30, standard deviation = 9.87. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (46-1) = 45. The t test revealed that $p > \alpha$, $t(45) = 1.5148$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 082 versus the ISD-A standard. The t test results are $t(45) = 1.5148$, $p > \alpha$.

DRG 425

A sample of 49 lengths of stay for a disposition of DRG 425, (acute adjustment reaction and disturbances of psychosocial dysfunction) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 425 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 425 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 9.39, standard deviation = 10.74. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (49-1) = 48. The t test revealed that $p > \alpha$, $t(48) = 0.9762$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 425 versus the ISD-A

standard. The t test results are t(48) = 0.9762, p > α.

DRG 426

A sample of 51 lengths of stay for a disposition of DRG 426, (depressive neuroses) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 426 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 426 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 8.37, standard deviation = 7.96. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (51-1) = 50. The t test revealed that p > α, t(50) = 0.5137, p > 0.05. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant

difference between MACH's length of stay for DRG 426 versus the ISD-A standard. The t test results are $t(50) = 0.5137$, $p > \alpha$.

DRG 270

A sample of 62 lengths of stay for a disposition of DRG 270, (other skin, subcutaneous tissue and breast operating room procedure without complications) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 270 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 270 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 3.42, standard deviation = 5.64. A hypothesis test for means was conducted using PlanPerfect. The degrees of freedom were n-1 (62-1) = 61. The t test revealed that $p > \alpha$, $t(61) = 0.4598$, p

> 0.05. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 270 versus the ISD-A standard. The t test results are $t(61) = 0.4598$, $p > \alpha$.

DRG 262

A sample of 64 lengths of stay for a disposition of DRG 262, (breast biopsy and local excision for non-malignancy) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 262 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 262 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 1.80, standard deviation = 1.33. A hypothesis test for means was conducted using PlanPerfect. The degrees of

freedom were n-1 (64-1) = 63. The *t* test revealed that $p > \alpha$, $t(63) = 0.3421$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 262 versus the ISD-A standard. The *t* test results are $t(63) = 0.3421$, $p > \alpha$.

DRG 427

A sample of 130 lengths of stay for a disposition of DRG 427, (neuroses except depressive) at MACH was extracted from the PASBA2 database. The dependent variable is defined as number of days hospitalized (continuous). The independent variable is defined as admitting facility (MACH versus ISD-A standard). The null hypothesis states that there is no statistically significant difference between MACH's lengths of stay for the disposition of DRG 427 compared to the ISD-A standard. The alternate hypothesis states that there is a statistically significant difference between MACH's lengths of stay for the disposition of DRG 427 compared to the ISD-A standard. The critical probability level (α) = 0.05. Descriptive statistics were computed with PlanPerfect and the results are attached in table 3: mean = 7.73, standard deviation = 6.35. A hypothesis test for means was conducted using

PlanPerfect. The degrees of freedom were n-1 (130-1) = 129. The *t* test revealed that $p > \alpha$, $t(129) = 0.6298$, $p > 0.05$. Thus, the null hypothesis is not rejected, indicating there is not a statistically significant difference between MACH's length of stay for DRG 427 versus the ISD-A standard. The *t* test results are $t(129) = 0.6298$, $p > \alpha$.

Results

Of the top 100 DRGs for MACH, our average length of stay exceeded the ISD-A standard for 51 DRGs (Table 2 on page 15); of those 51 DRGs, analysis revealed that we have a statistically significant higher average length of stay for 25 DRGs (Table 3 on page 18). These 25 DRGs added up to 4404.56 variance days.

Those DRGs that had statistically significant variance days were rank-ordered and are listed in Table 4 on page 76. A chart depicting the number of variance days per DRG is attached as figure 1 on page 75. Unnecessary total dollars per DRG and per admission were calculated and are listed as Table 5 on page 77. Using data supplied by the Resource Management Division, an average figure of $237 per variance day was used.

Figure 1

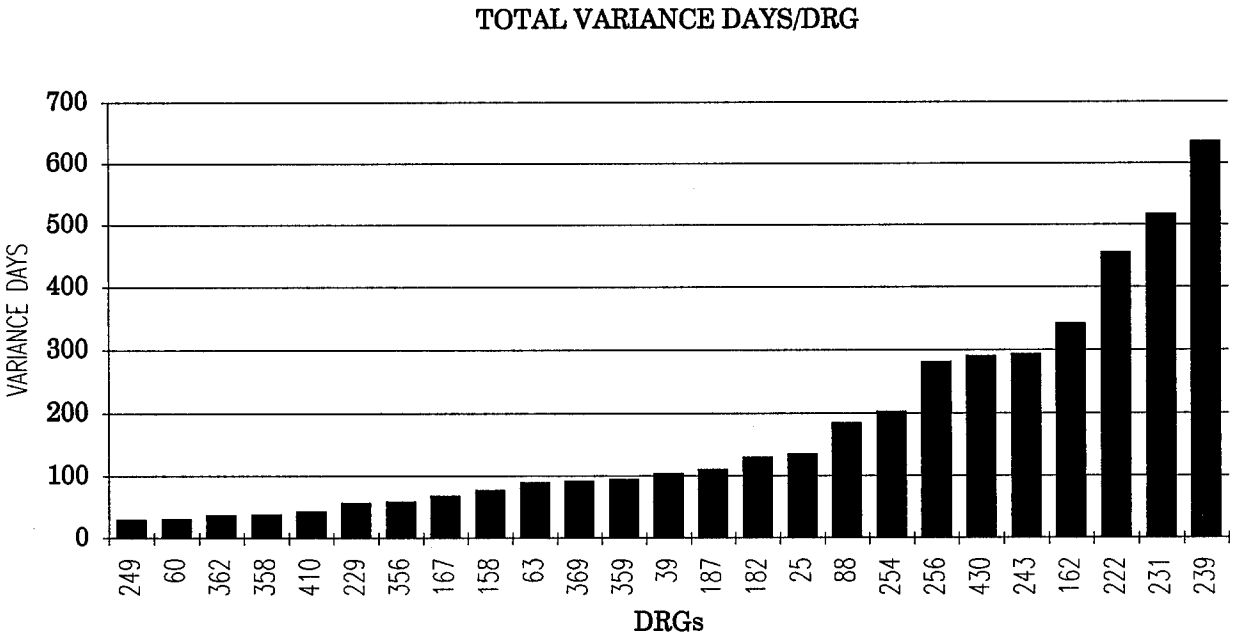
TOTAL VARIANCE DAYS/DRG
VARIANCE DAYS
700
600
500
400
300
200
100
0
249
60
362
358
410
229
356
167
158
63
369
359
39
187
182
25
88
254
256
430
243
162
222
231
239
DRGs

Table 4

Rank-Ordered DRGs by Total Variance Days

	DRG CODE	DRG TITLE	NUM DISPO	BEDDAYS	ACTUAL ALOS	EXPECTED ALOS	TOTAL VAR DAYS
1	239	PATH FRACTURES & MUSCULOSKELETAL & CONN	66	1231	18.65	9.02	635.68
2	231	LOCAL EXCISION & REMOVAL OF INT FIX DEVI	162	1108	6.84	3.65	516.70
3	222	KNEE PROCEDURES W/O CC	152	995	6.55	3.55	455.40
4	162	INGUINAL & FEMORAL HERNIA PROCEDURES AGE	88	563	6.40	2.51	342.12
5	243	MEDICAL BACK PROBLEMS	69	600	8.70	4.45	292.95
6	430	PSYCHOSES	30	767	25.57	15.90	290.00
7	256	OTHER MUSCULOSKELETAL SYSTEM & CONN TISS	64	618	9.66	5.27	280.72
8	254	FX SPRN, STRN & DISL OF UPARM, LOWLEG EX	46	433	9.41	5.00	203.00
9	088	CHRONIC OBSTRUCTIVE PULMONARY DISEASE	49	489	9.98	6.20	185.20
10	025	SEIZURE & HEADACHE > 17 W/O CC	32	238	7.44	3.21	135.28
11	182	ESOPHAGITIS, GASTROENT, & MISC DIGEST DI	126	555	4.40	3.37	130.38
12	187	DENTAL EXTRACTIONS & RESTORATIONS	311	577	1.86	1.50	110.50
13	039	LENS PROCEDURES W OR W/O VITRECTOMY	107	213	1.99	1.01	104.93
14	359	UTERUS & ADENEXA PROC FOR NON-MALIGNANCY	86	430	5.00	3.89	95.46
15	369	MENSTRUAL & OTHER FEMALE REPRO SYSTEM DI	53	233	4.40	2.66	92.02
16	063	OTHER EAR NOSE MOUTH & THROAT OR PROCEDU	22	151	6.86	2.77	90.06
17	158	ANAL AND STOMAL PROCEDURES W/O CC	23	146	6.35	2.97	77.69
18	167	APPENDECTOMY W/O COMPLICATED PRINCIPAL D	25	133	5.32	2.57	68.75
19	356	FEMALE REPRODUCTIVE SYSTEM RECONSTRUCTIV	26	174	6.69	4.40	59.60
20	229	HAND OR WRIST PROC, EXCEPT MAJOR JOINT P	76	205	2.70	1.94	57.56
21	410	CHEMOTHERAPY	75	288	3.84	3.26	43.50
22	358	UTERUS & ADENEXA PROC FOR NON-MALIGNANCY	23	138	6.00	4.34	38.18
23	362	ENDOSCOPIC TUBAL INTERRUPTION	48	85	1.77	0.98	37.96
24	060	TOLSILLECTOMY &/OR ADENOIDECTOMY ONLY, A	50	82	1.64	1.02	31.00
25	249	TENDONITIS, MYOSITIS & BURSITIS	42	397	9.45	8.74	29.92
							4404.56

Table 5

Excess Dollars Expended Total and Per Admission

	DRG CODE	DRG TITLE	NUM DISPO	BEDDAYS	TOTAL VAR DAYS	EXCESS DOLLARS PER ADMISSION	EXCESS DOLLARS TOTAL
1	239	PATH FRACTURES	66	1231	635.68	$2,282.67	$150,656.16
2	231	LOCAL EXCISION	162	1108	516.70	$755.91	$122,457.90
3	222	KNEE PROCEDURES	152	995	455.40	$710.06	$107,929.80
4	162	INGUINAL & FEMO	88	563	342.12	$921.39	$81,082.44
5	243	MEDICAL BACK PR	69	600	292.95	$1,006.22	$69,429.15
6	430	PSYCHOSES	30	767	290.00	$2,291.00	$68,730.00
7	256	OTHER MUSCULOSK	64	618	280.72	$1,039.54	$66,530.64
8	254	FX SPRN, STRN &	46	433	203.00	$1,045.89	$48,111.00
9	088	CHRONIC OBSTRUC	49	489	185.20	$895.76	$43,892.40
10	025	SEIZURE & HEADA	32	238	135.28	$1,001.92	$32,061.36
11	182	ESOPHAGITIS, GA	126	555	130.38	$245.24	$30,900.06
12	187	DENTAL EXTRACTI	311	577	110.50	$84.21	$26,188.50
13	039	LENS PROCEDURES	107	213	104.93	$232.42	$24,868.41
14	359	UTERUS & ADENEX	86	430	95.46	$263.07	$22,624.02
15	369	MENSTRUAL & OTH	53	233	92.02	$411.49	$21,808.74
16	063	OTHER EAR NOSE	22	151	90.06	$970.19	$21,344.22
17	158	ANAL AND STOMAL	23	146	77.69	$800.54	$18,412.53
18	167	APPENDECTOMY W/	25	133	68.75	$651.75	$16,293.75
19	356	FEMALE REPRODUC	26	174	59.60	$543.28	$14,125.20
20	229	HAND OR WRIST P	76	205	57.56	$179.50	$13,641.72
21	410	CHEMOTHERAPY	75	288	43.50	$137.46	$10,309.50
22	358	UTERUS & ADENEX	23	138	38.18	$393.42	$9,048.66
23	362	ENDOSCOPIC TUBA	48	85	37.96	$187.43	$8,996.52
24	060	TONSILLECTOMY &	50	82	31.00	$146.94	$7,347.00
25	249	TENDONITIS, MYO	42	397	29.92	$168.83	$7,091.04
					4404.56		$1,043,880.72

Discussion

General

Of the 100 DRGs studied, 25 exceed ISD-A standards by a statistically significant difference for a total of 4404.56 variance days. Of these 25 DRGs, 50% are Major Diagnostic Category (MDC) 8, or diseases and disorders of the musculoskeletal system and connective tissue. All of the DRGs in MDC 8 are handled by one service, orthopedic surgery. As Fort Jackson's primary mission is Basic Combat Training (BCT), the higher than expected ALOS for orthopedic cases might be mission essential. Soldiers undergoing BCT usually cannot be released back to duty until they are fully recovered. Thus, while many of our orthopedic patients might be discharged from a civilian hospital, we have a duty at Fort Jackson to keep them hospitalized until they are fully recovered and fit for training.

Of the remaining high ALOS DRGs, no one service predominates. However, many of the remaining higher ALOS can be justified by our BCT mission. One of these is DRG 430 (Psychoses), which involves a large number of basic trainees undergoing evaluation for separation as a manifestation of the stress involved in undergoing BCT. Other DRGs that have a high ALOS might be

attributed to our large elderly beneficiary population, to include DRGs 410 (Chemotherapy), 088 (Chronic Obstructive Pulmonary Disease), and 039 (Lens Procedures).

The case managers at MACH have started to work on critical paths for our patients. As a first step, the case managers are developing a critical path for Chest Pain (DRG 143). They are working closely with physicians and other health care providers, and early indications show the medical staff is receptive to the principle of critical paths.

Nevertheless, the data show that we have room for improvement. Those DRGs that have a high ALOS account for a significant amount of the variable costs associated with a high patient census. It is on these DRGs that we would receive the greatest return on our investment of case managers.

Shortcomings of the Study

This study does not address the overall institutional efficiency of Moncrief Army Community Hospital. Rather, it focuses only on those areas where we might have room for improvement. Analysis of our top 100 DRGs shows that our overall number of variance days is 1002.7, i.e. there are many DRGs (49 of the 100

analyzed) for which we have shorter ALOS. Thus, this is not a commentary on Moncrief Army Community Hospital. It is merely the first step that we have undertaken to improve our efficiency.

As this study was based on FY 92 data, it does not take into account changes that have been instituted in the current FY. We have instituted a same-day surgery (SDS) program, and are averaging about 10 patients per day. Some of the procedures we perform in SDS will decrease our ALOS in the 25 DRGs that have significant variance days. Specifically, those DRGs are 187 (Dental Extractions & Restorations), 39 (Lens Procedures with or without Vitrectomy), and 60 (Tonsillectomy and/or Adenoidectomy, Age 0 - 17). Continued expansion of the SDS program will continue to decrease our overall ALOS.

This study does not address the techniques and strategies that case managers might use to reduce the number of variance days. Rather, it is a starting point to use to attack the problem of unnecessary hospitalization. The next step in the study should be to conduct a concurrent analysis of those admission diagnoses that have high ALOS. From this next step, a plan will have to be implemented to reduce the variance

days. Some of the reasons for variance days might include institutional inefficiency, physician practice patterns, or social reasons.

Conclusions and Recommendations

From this study we can see that we have an opportunity to reduce unnecessary lengths of stay. There are three primary methods to eliminate variance days at MACH: refinement of the case manager program, institution of a subacute treatment facility, and expansion of the SDS program.

As our case managers gain expertise in the planning, development and execution of critical pathways, we will see a consequent reduction in variance days. In fact, the case managers have already started to plan and develop critical pathways, and one for chest pain is soon to be instituted. Should this critical pathway be successful in increasing the efficiency and effectiveness of the treatment of chest pain, it is likely that the instiution in general and clinicians in particular will be more likely to accept further application of critical pathways. As we start to plan and develop critical pathways for those DRGs that have a high ALOS, there will be an inevitable decrease in variance days.

Because many of the variance days can be accounted for by our social mission, i.e. keeping trainees

hospitalized until they are completely recovered and fit to re-enter BCT, we are beginning to explore the possibility of keeping these soldiers in a subacute facility or an infirmary. This should greatly reduce variance days, especially in orthopedic patients that often have a long recovery period.

The initial success of the SDS program is encouraging. Patients and providers alike are enthusiastic about it, and expansion of the program is being planned. It is certain that further growth of this program will result in a marked decrease in variance days.

If we are able to eliminate only 1000 of our 4404.56 variance days (less than 25% of the total), at $237 per variance day, this will result in savings of $237,000. This will allow MACH to use its resources more wisely and, as such, we will be able to expand and improve the quality of our services to our eligible population using the dollars saved. Also, it will enable us to slow the growth of expenditures on military health care, which is one of the primary objectives of GTC.

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